RSW Product
User's Manual
Firmware 5.00 and up

Last Update: December 31 2013
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Disclaimer

Zaber’s devices are not intended for use in any critical medical, aviation, or military applications or situations where a product's use or failure could cause personal injury, death, or damage to property. Zaber disclaims any and all liability for injury or other damages resulting from the use of our products.

Precautions

Zaber's rotary motion control devices are precision instruments and must be handled with care. In particular, moving parts must be treated with care. Avoid torque loads in excess of the rated maximum torque load, impact, dust and other contaminants and damage to the worm and worm gear. These will reduce the performance of the device below stated specifications.

Installation

Mounting

You can mount the RSW series rotary stages by the three M6 or 1/4"x20 mounting holes on the bottom flange of the stage. There are also two M6 threaded holes on the sides of the stage available for mounting purposes. See the RSW web page for dimensions, technical specifications and other details.

Grounding

To prevent damage to the device due to static buildup, the device should be properly grounded.

Failure to ground the unit may result in the unit shutting down unexpectedly or ceasing to communicate with the computer. This problem can be minimized by not touching the unit during operation. If the unit fails due to static discharge, unplugging it and plugging it back in or sending a Restore Settings command will usually fix the problem.

Most Zaber devices are grounded via the shield wire of the data cables. This should normally provide a path to ground via the computer. For units which are being used without a computer, a ground lead should be connected to the shield of one of the data cables.

Physical Installation

Mounting

There are several options available for mounting Zaber stages. Use the mounting holes in the bottom to mount to a surface or to another stage. You might have to move the carriage to access the bottom mounting holes. Some stages have mounting holes in the end plates for mounting vertically. Mounting screws are included with most stages.

Caution: Some stages have threaded through-holes in the top mounting plate of the carriage. Be sure not to install mounting screws too deep, causing them to interfere with inside parts of the stage.

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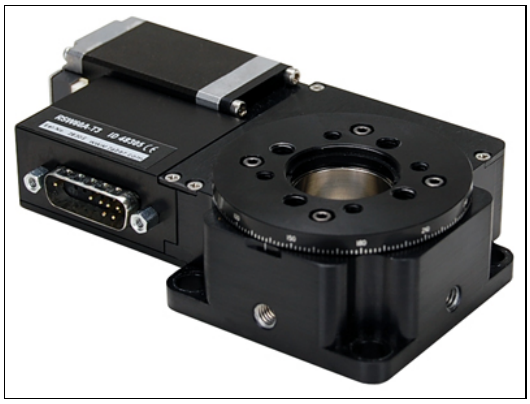
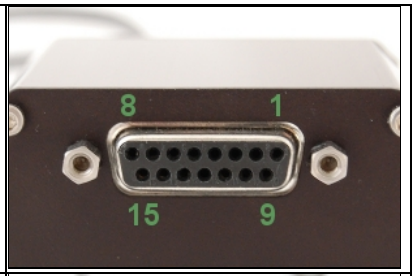
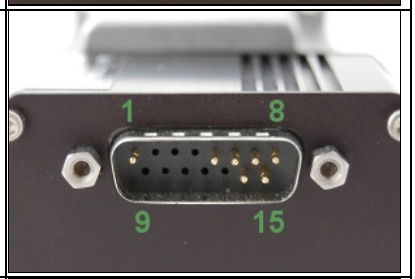
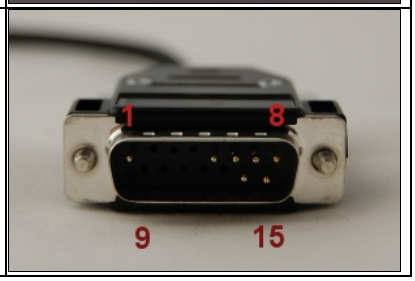
Operation

The RSW-T3 stages are designed to be controlled with the A-MCA series chopper drive controllers. It is important to know the peripheral id of your motor. If you ever need to restore the correct settings for your RSW-T3 stage, send restore settings (command 36) with the peripheral ID in the data field.



Pinout for D-sub 15 Connectors (A-series controllers and peripherals)

A-series controller (female)	
T3 Peripheral (male)	
T4 Peripheral (male)	

Pin #	Function
1	+5V

2	*reserved*
3	*reserved*
4	*reserved*
5	Home Sensor
6	Ground
7	Motor B1
8	Motor A1
9	+5V *
10	Encoder A *
11	Encoder B *
12	Encoder Index *
13	Ground *
14	Motor B2
15	Motor A2

** encoder embedded peripherals only*

Alternate Controllers

The actuators may be controlled by any 2-phase stepper motor controller with home sensor input. **Warning: Operating the stage without correctly wiring up the home sensor can cause permanent damage to the sensor. We do not recommend using your own controller unless you are familiar with how to control a stepper motor with a hall sensor limit switch.** The following information is provided for reference only. Damage to the stage or hall sensor due to incorrect wiring is not covered by warranty.

Motor

The RSW stage uses a size 11 stepper motor.

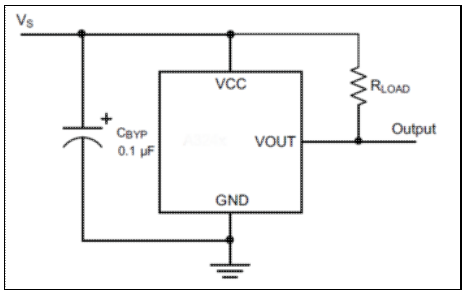
- 1.5 A / Phase
- 2.05 / phase
- 1.0 mH / phase

Home Sensor Wiring

A Hall effect sensor is mounted in the device for use as a home sensor. It is part number A1122LUA-T made by Allegro. Click here for data sheet. Your controller should be configured so the stage stops immediately (little deceleration) when the home sensor is triggered.

- Wire colour code:
  - 3.6-24 Vdc input - red
  - Home signal - yellow
  - Ground - black

The Hall sensor has an open-collector output. The default output is high impedance when the Hall sensor is not active. When the sensor detects a magnet, the Hall sensor pulls the output low to ground.



If you are not using a Zaber controller, ensure that your controller has a pull-up resistor on the output line of the Hall sensor as shown in the diagram. The bypass capacitor is optional, but may help to eliminate false triggering in noisy environments. The typical value for the pull-up resistor (R_{LOAD}) is 10k and for the bypass capacitor is 0.1uF to 1uF. The larger the capacitance, the better the noise filtering but the slower the response time.

Warranty and Repair

For Zaber's policies on warranty and repair, please refer to the Ordering Polices

Standard products

Standard products are any part numbers that do not contain the suffix ENG followed by a 4 digit number. Most, but not all, standard products are listed for sale on our website. All standard Zaber products are backed by a one-month satisfaction guarantee. If you are not satisfied with your purchase, we will refund your payment minus any shipping charges. Goods must be in brand new saleable condition with no marks. Zaber products are guaranteed for one year. During this period Zaber will repair any products with faults due to manufacturing defects, free of charge.

Custom products

Custom products are any part numbers containing the suffix ENG followed by a 4 digit number. Each of these products has been designed for a custom application for a particular customer. Custom products are guaranteed for one year, unless explicitly stated otherwise. During this period Zaber will repair any products with faults due to manufacturing defects, free of charge.

How to return products

Customers with devices in need of return or repair should contact Zaber to obtain an RMA form which must be filled out and sent back to us to receive an RMA number. The RMA form contains instructions for packing and returning the device. The specified RMA number must be included on the shipment to ensure timely processing.

Email Updates

If you would like to receive our periodic email newsletter including product updates and promotions, please sign up online at www.zaber.com (news section). Newsletters typically include a promotional offer worth at least $100.

Contact Information

Contact Zaber Technologies Inc by any of the following methods:

Phone	1-604-569-3780 (direct) 1-888-276-8033 (toll free in North America)
Fax	1-604-648-8033
Mail	1777 West 75th Ave, 1st Floor, Vancouver, BC, Canada, V6P 6P2
Web	www.zaber.com
Email	Please visit our website for up to date email contact information.

Group Specifications - RSW Series

Specification	Value	Alternate Unit
Integrated Controller	No	
Recommended Controller	A-MCA (48 V) Recommended	
Range	360 degrees	
Accuracy (unidirectional)	0.14 degrees	2.443000 mrad
Repeatability	< 0.02 degrees	< 0.349 mrad
Backlash	< 0.08 degrees	< 1.396 mrad
Encoder Type	None	
Stage Diameter	60 mm	2.362 "
Motor Type	Stepper (2 phase)	
Motor Rated Current	1500 mA/phase	
Motor Winding Resistance	2.05 ohms/phase	
Inductance	1 mH	
Motor Connection	DB 15 male	
Mechanical Drive System	Precision Worm Gear	
Limit or Home Sensing	Magnetic home sensor	
RoHS Compliant	Yes	
CE Compliant	Yes	
Weight	0.62 kg	

Comparison - RSW Series

Part Number	Microstep Size (Default Resolution)	Maximum Speed	Minimum Speed	Maximum Continuous Torque
RSW60A-T3	0.000234375 degrees (4.091 urad)	100 deg/s (16.7 rpm)	0.000143 deg/s (2.496 urad/s)	80 N-cm (113.3 oz-in)
RSW60C-T3	0.0009375 degrees (16.362 urad)	400 deg/s (66.7 rpm)	0.000572 deg/s (9.983 urad/s)	60 N-cm (85.0 oz-in)